



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

DIVISION: MATERIALS

REPORT COVER SHEET

Revised Soil Survey Report
November 24, 2015
Matthew G. Moore, P.E.

The seal of the Commonwealth of Virginia Professional Engineer, featuring a circular design with the words "COMMONWEALTH OF VIRGINIA" and "PROFESSIONAL ENGINEER" around the perimeter, and "MATTHEW GLEN MOORE Lic. No. 035064" in the center.		
VDOT (Division) or Company Name Insert Location, Virginia Insert Technical Discipline	VDOT Materials - Culpeper District Culpeper, Virginia Geotechnical Engineering	VDOT (Division) or Company Name Insert Location, Virginia Insert Technical Discipline

Responsible for Pages

Responsible for Pages 1 to 5

Responsible for Pages

Project Description

From: 0.219 Mi. South of Rte. 718
To: 0.107 Mi. North of Rte. 718
Project UPC No.: 104805



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

1601 Orange Road
Culpeper, Virginia 22701

Charles A. Kilpatrick, P.E.
Commissioner

November 24, 2015

Project: HSIP-023-707, P101, M-501
UPC #: 104805
From: 0.219 Mi. South of Rte. 718
To: 0.107 Mi. North of Rte. 718
Length: 0.326 mi.

To: Culpeper District Location & Design

Subject: Revised Soil Survey Report, Route 29 & 718 Intersection, Culpeper County

This revised soil survey report is based on a total of eight (8) soil borings performed on May 13, 2015. The borings were extended to depths ranging between 5.0 feet and 10.0 feet below existing ground surface elevations. The existing pavement was investigated at four of the borings locations. The purpose of the project is to improve the Route 29 and Route 718 intersection for safety. According to Integrated Project Management (IPM) system information, the project is currently scheduled for construction to begin in year 2016.

Soil Description & Groundwater

Strata consisting of Clay (CL), Silt (ML), silty Sand (SM) and/or fat Clay (CH), with mica content, were encountered at the boring locations. Soil descriptions are provided as an attachment. Groundwater was not encountered within the borings. The borings were backfilled upon completion and long-term groundwater reading was not performed. Auger refusal, possibly indicating the top of rock, was not encountered.

Existing Pavement Structure

Existing pavement was investigated at four of the boring locations. At two of the boring locations (BH-3 & BH-5), the pavement structure was first cored, before augering through, in order to retain samples and observe the condition of material layers. The pavement structure material thicknesses, asphalt concrete (AC) and base/sub-base aggregate, are provided in the table below. The stations and offsets are approximate.

Boring Location	*Station	Offset	AC Thickness & Location	Ex. Aggregate Thickness	Total Pavement Thickness
BH-3	114+75	35' Left	12" -Mainline	6"	18"
BH-5	117+00	30' Right	12"-Mainline	3"	15"
BH-7	201+25	15' Right	3"-Route 718	6"	9"
BH-8	120+85	5' Right	4"- Ex. Rte. 29 intersection/crossover to Rte. 718	6"	10"

* The stations are based on the Route 29 or Route 718 alignments shown on the plans.

Pavement Structure Recommendations

Recommended materials and thicknesses for new pavement structures are as follows:

New Pavement- Route 29 & 718 Mainline, Turn Lanes & Crossovers

For Surface: Use 1.5 inches of Asphalt Concrete, Type SM-9.5D.

For Intermediate: Use 3.0 inches of Asphalt Concrete, Type IM-19.0A.*

For Base: Use 6.0 inches of Asphalt Concrete, Type BM-25.0A.

For Subbase: Use 8.0 inches of Aggregate Base, Type I, Size No. 21-B.

New Pavement- Route 29 & 718 Shoulders

For Surface: Use 1.5 inches of Asphalt Concrete, Type SM-9.5D.

For Base: Use 3.0 inches of Asphalt Concrete, Type IM-19.0.0A.*

For Subbase: Use 14.0 inches of Aggregate Base, Type I, Size No. 21-B.

*BM-25.0A can be substituted for IM-19.0A if the new pavement will not be subjected to traffic for more than 30 days prior to placing the asphalt concrete surface mix.

The plans obtained through Integrated Project Manager indicate that the existing Route 29 and Route 718 pavements are to be milled and replaced with variable depths of asphalt concrete in order to achieve final grade and geometric design. It is recommended to mill a minimum of 1.5" to remove the existing wearing surface and replace with a minimum of 1.5" of SM-9.5 surface mix to match the new pavement structures recommended above. If asphalt concrete thicknesses greater than 1.5" will be required to meet final proposed grade after milling, use intermediate and/or base mix asphalt concrete. Asphalt concrete mixes should be placed with minimum and maximum lift thicknesses in accordance with Chapter 6 of the VDOT Manual of Instructions (MOI – Materials). Variable depth milling may be required to meet the minimum lift thicknesses. It should be noted that the minimum mill and replace depth for existing pavement structure indicated above is not based on structural design life and the new wearing surface should only be considered a functional overlay. A structural rehabilitation or overlay design was not applied to the existing mainline pavement structures.

The pavement structure recommendation, for Route 29 and Route 718 mainline, was based on the 1993 AASHTO Guide for Design of Pavement Structures. A resilient modulus value of 4500 psi, 27,818 vehicles per day in year 2016 (two-way traffic) and a growth rate of 1.0 percent were used for calculating the required structural number. Traffic data was provided on the current plan set title sheet.

Widening of existing pavement should include demolition and removal of existing shoulder pavement. Additionally, construct new pavement structure adjacent to existing mainline in accordance with WP-2 of the VDOT Road and Bridge Standards..

The subbase stone should be connected to UD-4 edge-drain and CD-2 under-drain per VDOT Road and Bridge Standards with positive drainage to outlet points or the subbase stone can be day-lighted to embankment slopes or ditches if enough adequate freeboard is available. For crown sections, edge-drain should be placed along both sides of proposed pavement and along the low side, only, for super-elevated sections. If elevation, placement, easement or right-of-way constraints do not allow for construction of UD-4 or CD-2 per the Standards, Culpeper Materials should be informed for any modifications to the Standards and/or changes to the pavement structure recommendations provided above.

Earthwork & Materials

Regular Excavation

Soils from planned cuts along the Route 29 alignment between stations 113+00 and 117+00 can be used with for construction of embankment. It is recommended to plan on limiting cut soils between Station 119+25 and the end of project to 3.0 feet below proposed subgrade, widening slopes beyond structural areas or wasting off-site.

Unsuitable Subgrade & Embankment Stabilization

It is recommended to plan for stabilizing or removing unsuitable subgrade in cut areas and stabilizing embankment/fill soils as follows:

- Route 29, Station 111+20 to 111+ 85, proposed crossover – remove soils within 4.0 feet of proposed subgrade elevation for the new pavement and up to 20.0 feet from the baseline (both sides). Place 12.0” of **VDOT Size No. 3 or 357 Open-Graded Coarse Aggregate** over geotextile **Embankment Stabilization Fabric**. Cap the No. 3 or No. 357 stone with 6.0” of **VDOT Size No. 57 Open-Graded Coarse Aggregate** and then place compacted regular excavation or borrow soils up to proposed subgrade elevation.
- Route 29 NBL, Station 119+25 to end of project, proposed turn lane, crossover and shoulders – remove soils from within 6.0” of proposed subgrade for mainline pavement and up to 2.0 feet beyond paved shoulders. For the proposed turn lane and crossover, replace the undercut with **6.0” of Select Material, Type I, CBR-30** over geotextile **Subgrade Stabilization Fabric**. For the proposed new pave shoulder beyond, east of, the proposed crossover shoulder, replace undercut with **6.0” Select Material, Type I** only.

Plan for wasting undercut soils. Generally, subgrade observation and preparation should be in accordance with the current version of the VDOT Road and Bridge Specifications. The Select Material should be connected to UD-4 or day-lighted for drainage. The depth of the UD-4 should be deepened to below the Select Material in accordance with VDOT Road and Bridge Standards (modified UD-4).

Slopes

All cut and fill slopes should be no steeper than a ratio of 2 horizontal to 1 vertical (2H: 1V).

Earthwork Volumes

Use 15.0% shrinkage factor for earthwork volume computations. Use average 6.0” for vegetation and topsoil removal.

Borrow

Borrow soils should have a minimum CBR value of 5.0, maximum Liquid Limit (LL) of 45 and maximum plasticity index of 20.

Source of Materials

Aggregates

Two sources for aggregate material, located within the Culpeper District and near to the project location, are provided below along with recent test results data for selected products.

Luck Stone Corp- Culpeper

Aggregate Base Material, Type I, Size No. 21-A – maximum dry density 144.6 lbs. / cu. ft. at 6.8% optimum moisture content.

Aggregate Base Material, Type I, Size No. 21-B – maximum dry density 146.2 lbs. / cu. ft. at 6.3% optimum moisture content.

Select Material, Type I, CBR-30 – maximum dry density 145.3 lbs. / cu. ft. at 6.6% optimum moisture content.

Cedar Mountain Stone – Mitchells

Aggregate Base Material, Type I, Size No. 21-A – maximum dry density 162.2 lbs. / cu. ft. at 4.8% optimum moisture content.

Aggregate Base Material, Type I, Size No. 21-B – maximum dry density 161.4 lbs. / cu. ft. at 4.9% optimum moisture content.

Select Material, Type I, CBR-30 – maximum dry density 160.6 lbs. /cu. ft. at 5.8% optimum moisture content.

For Open-Graded Aggregate, Size No. 57, a unit weight of 102.0 lbs. / cu. ft. is recommended for quantity calculations.

Matthew G. Moore. P.E.
Geotechnical/Pavement Engineer
Culpeper District Materials

Attachments:

Appendix A – Approximate Boring Locations

Appendix B – Boring Logs

Appendix A

Approximate Boring Locations

Approximate Boring Locations

PROJECT MANAGER David Cubbage, L.S.: (540) 829-7554, Culpeper District
SURVEYED BY, DATE Michael C. Mauro, L.S.: (540) 829-7551, Culpeper District, 2015
DESIGN BY Justin D. Warfield: (540) 829-7599, Culpeper District
SUBSURFACE UTILITY BY, DATE Michael C. Mauro, L.S.: (540) 829-7551, Culpeper District, 2015

Utility Owners:

CATV
Comcast
Jim Kleiderlein
1080 Brandy Knoll Ct.
Culpeper, VA 22701
866-859-6080 ext. 639/451

Electric
Dominion Power
120 Tredegar Street
Richmond, VA 23219
866-366-4357

Electric
Rappahannock Electric Cooperative
Randy Ross
P.O. Box 392
Culpeper, VA 22701
540-825-8373

Telephone
Verizon
Dave Russell
502 E. Piedmont St.
Culpeper, VA 22701
540-368-8176

Elther Optic Communications
MCI / Verizon Business
David Fisher
12379 Sunrise Valley Dr.
Suite A
Reston, VA 20191
703-391-5767

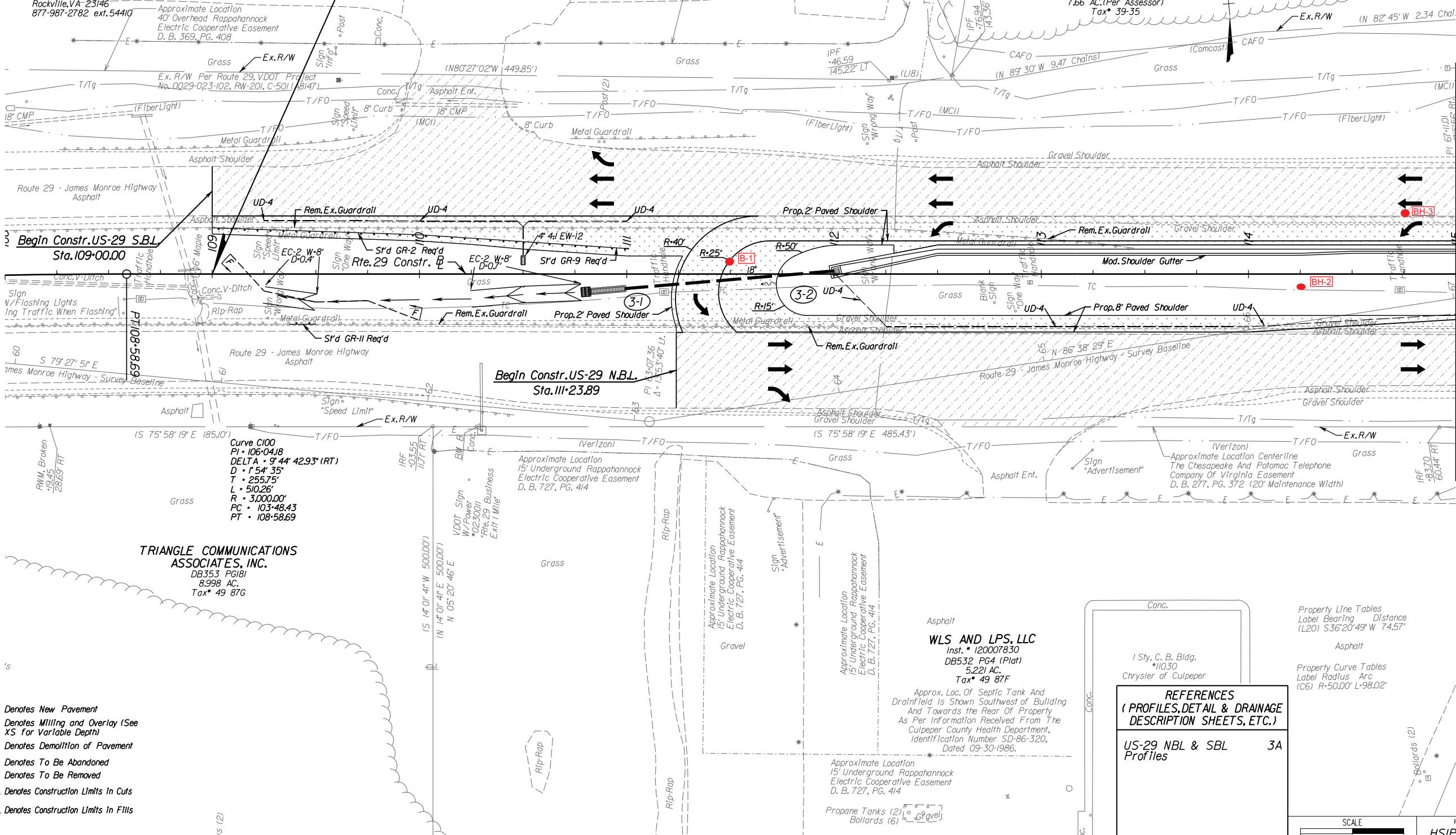
Elther Optic Communications
Qwest / CenturyLink
Noah Dobbins, P.E.
2950 Towerview Road
Suite 150
Herndon, VA 20171
703-464-7529

Water
Aqua America
Steve Barnes
2414 Granite Ridge Rd.
Rockville, VA 23146
877-987-2782 ext. 54410

CULPEPER REAL ESTATE ASSOCIATES, LLC

Inst. # 07000839
Inst. # 130001772 (Plat)
4.9998 AC.
Tax # 39 35F1

Begin Proj. HSIP-023-707, PE-101, M-501
Sta. 109+00.00



Curve C100
PI = 106+04.8
DELTA = 9° 44' 42.93" (RT)
D = 1° 54' 35"
T = 255.75'
L = 510.26'
R = 3,000.00'
PC = 103+48.43
PT = 108+58.69

TRIANGLE COMMUNICATIONS ASSOCIATES, INC.
DB353 PG181
8.998 AC.
Tax # 49 87G

Approximate Location
15' Underground Rappahannock Electric Cooperative Easement
D. B. 727, PG. 414

WLS AND LPS, LLC
Inst. # 120007830
DB532 PG4 (Plat)
5.221 AC.
Tax # 49 87F

Approx. Loc. Of Septic Tank And Drainfield Is Shown Southwest Of Building And Towards The Rear Of Property As Per Information Received From The Culpeper County Health Department, Identification Number SD-86-320, Dated 09-30-1986.

Approximate Location
15' Underground Rappahannock Electric Cooperative Easement
D. B. 727, PG. 414

Property Line Tables
Label Bearing Distance
(L20) S36°20'49" W 74.57'

Property Curve Tables
Label Radius Arc
(C6) R=50.00' L=98.02'

1 Sty. C. B. Bldg.
*11Q30
Chrysler of Culpeper

REFERENCES
(PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

US-29 NBL & SBL
Profiles

SCALE
0 25' 50'

PROJECT
HSIP-023-707

SHEET NO.
3

VDOT Culpeper District
Design Unit

PUBLIC HEARING PLANS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY.

Approximate Boring Locations

PROJECT MANAGER David Cubbage, L.S. - (540) 829-7554, Culpeper District
SURVEYED BY DATE Michael C. Mauro, L.S. - (540) 829-7551, Culpeper District, 2015
DESIGN BY Justin D. Warfield - (540) 829-7559, Culpeper District
SUBSURFACE UTILITY BY DATE Michael C. Mauro, L.S. - (540) 829-7551, Culpeper District, 2015
Utility Owners:

CATV
Comcast
Jim Kleiderlein
1080 Kenderlin Ct.
Culpeper, VA 22701
866-859-6080 ext. 6391451

Electric
Dominion Power
120 Tredegar Street
Richmond VA 23219
866-366-4357

Electric
Rappahannock Electric Cooperative
Randy Ross
P.O. Box 392
Culpeper, VA 22701
540-825-8373

Telephone
Verizon
Dave Russell
502 E. Piedmont St.
Culpeper, VA 22701
540-368-8176

Fiber Optic Communications
MCI / Verizon Business
David Fisher
12379 Sunrise Valley Dr.
Suite A
Reston, VA 20191
703-391-5767

Fiber Optic Communications
Qwest / CenturyLink
Noah Dobbins, P.E.
2950 Townview Road
Suite 150
Herndon, VA 20171
703-464-7529

Water
Aqua America
Steve Barnes
2414 Granite Ridge Rd.
Rockville, VA 23146
877-987-2782 ext. 54410

RAYMOND F. MYERS, TRUSTEE
GALE N. JOHNSON, TRUSTEE
Inst. # 060008196
7.66 AC. (Per Assessor)
Tax # 39-35

Approx. Loc. Of Well Is Shown Outside
Of Survey Limits And Approx. Loc. Septic
System Shown As Per Information Received
From The Culpeper County Health Department,
Case Number 39-35, Dated 10-12-1982.

Curve RT71813
PI • 204.3491
DELTA • 3° 29' 10.79" (LT)
D • 0' 41' 25"
T • 252.60'
L • 505.04'
R • 8,300.00'
PCC • 201.82.32
PT • 206.87.36
E • Match Existing
V • Match Existing

Curve RT71812
PI • 201.5801
DELTA • 7° 26' 17.04" (LT)
D • 15' 16' 44"
T • 24.38'
L • 48.68'
R • 375.00'
PCC • 201.33.64
PT • 201.82.32
E • Match Existing
V • 30 MPH

Curve RT71811
PI • 200.99.06
DELTA • 26° 55' 25.63" (LT)
D • 38' 11' 50"
T • 35.91'
L • 70.49'
R • 150.00'
PC • 200.63.15
PCC • 201.33.64
E • See Cross Sections
V • 20 MPH

GRACE MUNSON NICHOLS
WINIFRED MUNSON PREUSSER
MARY LOU WOODRUFF
BETTY M. JEAVONS
DB596 PG512
DB174 PG83 (Plat)
35.95 AC.
Tax # 49.87E

REFERENCES
(PROFILES, DETAIL & DRAINAGE
DESCRIPTION SHEETS, ETC.)

US-29 NBL & SBL 4A
Profiles
Route 718 Profile 4A

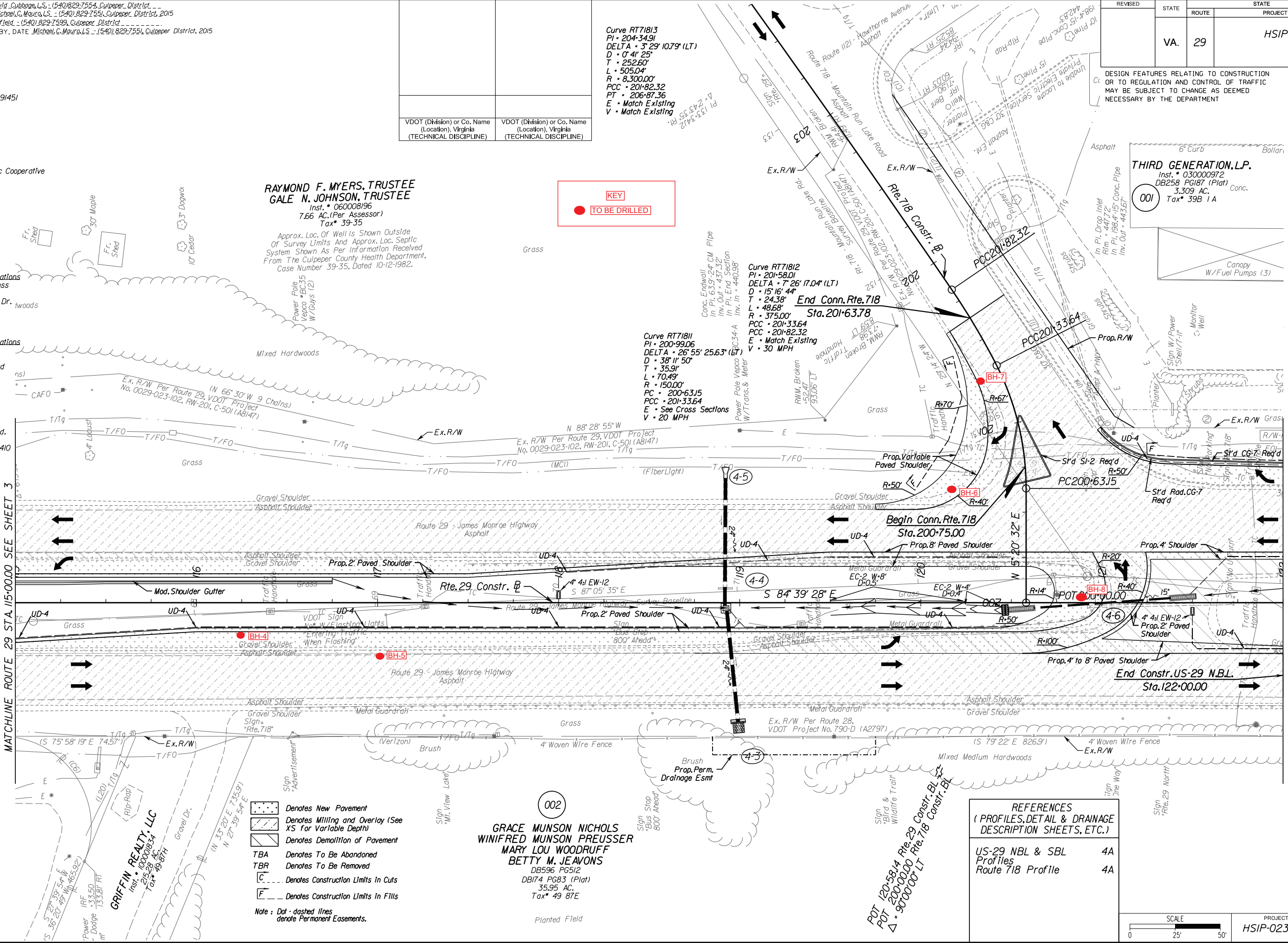
REVISED	STATE	ROUTE	STATE	PROJECT	SHEET NO.
	VA.	29		HSIP-023-707 M-501	4

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

THIRD GENERATION, L.P.
Inst. # 030000972
DB258 PG187 (Plat)
3.309 AC.
Tax # 39B 1A

KEY
● TO BE DRILLED

VDOT Culpeper District
Design Unit



- Denotes New Pavement
 - Denotes Milling and Overlay (See XS for Variable Depth)
 - Denotes Demolition of Pavement
 - TBA Denotes To Be Abandoned
 - TBR Denotes To Be Removed
 - Denotes Construction Limits In Cuts
 - Denotes Construction Limits In Fills
- Note: Dot - dashed lines denote Permanent Easements.

SCALE	PROJECT	SHEET NO.
0 25' 50'	HSIP-023-707	4

PUBLIC HEARING PLANS

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Approximate Boring Locations

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DESIGN BY Justin D. Warfield - (540) 829-7559, Culpeper District
SUBSURFACE UTILITY BY, DATE Michael C. Mauro, L.S. - (540) 829-7551, Culpeper District, 2015

THIRD GENERATION, L.P.

Inst. # 030000972
DB258 PG187 (Plat)
3.309 AC.
Tax* 39B 1A

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Jim Kleiderlein
1080 Brandy Knoll Ct.
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866-859-6080 ext. 6391451

Electric
Dominion Power
120 Tredgar Street
Richmond VA 23219
866-366-4357

Electric
Rappahannock Electric Cooperative
Randy Ross
P.O. Box 392
Culpeper, VA 22701
540-825-8373

Telephone
Verizon
Dave Russell
502 E. Piedmont St.
Culpeper, VA 22701
540-368-8176

Fiber Optic Communications
MCI / Verizon Business
David Fisher
12379 Sunrise Valley Dr.
Suite A
Reston, VA 20191
703-391-5767

Fiber Optic Communications
Qwest / CenturyLink
Noah Dobbins, P.E.
2950 Towerview Road
Suite 150
Herndon, VA 20171
703-464-7529

Water
Aqua America
Steve Barnes
2414 Granite Ridge Rd.
Rockville, VA 23146
877-987-2782 ext. 54410

L AQUA VIRGINIA, INC.

Inst. # 100005715
DB258 PG187 (Plat)
0.23 AC.
Tax* 39B 1W

End Proj. HSIP-023-707, PE-101, M-501
Sta. 126+25.00

End Constr. US-29 S.B.L.
Sta. 126+25.00

End Constr. US-29 N.B.L.
Sta. 122+00.00

GRACE MUNSON NICHOLS
WINIFRED MUNSON PREUSSER
MARY LOU WOODRUFF
BETTY M. JEAVONS
DB596 PG512
PC3 PG245
3.444 AC.
Tax* 49 87E

GRACE MUNSON NICHOLS
WINIFRED MUNSON PREUSSER
MARY LOU WOODRUFF
BETTY M. JEAVONS
DB596 PG512
PC3 PG245
3.444 AC.
Tax* 49 87DI

REFERENCES
(PROFILES, DETAIL & DRAINAGE
DESCRIPTION SHEETS, ETC.)

US-29 NBL & SBL 5B
Profiles
Entr. Profile 123+25 X17

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	HSIP-023-707 M-501	5

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

VDOT (Division) or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE)	VDOT (Division) or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE)

VDOT
Culpeper District
Design Unit

- Denotes New Pavement
- Denotes Milling and Overlay (See 'X'S' for Variable Depth)
- Denotes Demolition of Pavement
- TBA Denotes To Be Abandoned
- TBR Denotes To Be Removed
- C Denotes Construction Limits in Cuts
- F Denotes Construction Limits in Fills

PUBLIC HEARING PLANS

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SCALE	PROJECT	SHEET NO.
0 25 50	HSIP-023-707	5

Appendix B

Boring Logs





PROJECT #: HSIP-023-707,P101,M501
 LOCATION: Culpeper
 STRUCTURE: CUT

BH-2

PAGE 1 OF 1

STATION: 114+25
 NORTHING: ft
 SURFACE ELEVATION: 449.0 ft

OFFSET: 10' Right CL
 Easting: ft
 COORD. DATUM:

FIELD DATA

Date(s) Drilled: 5/13/15 - 5/13/15
 Drilling Method(s): 3.25 in HSA
 SPT Method: Automatic
 Other Test(s):
 Driller: O. Gomez (DMY)
 Logger: Assefa A. (VDOT)

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK				STRATA LEGEND	LAB DATA					
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °		GROUND WATER	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	FINES CONTENT #200 (%)	
								STRATA							JOINTS
Drilling Method(s): 3.25 in HSA SPT Method: Automatic Other Test(s): Driller: O. Gomez (DMY) Logger: Assefa A. (VDOT)											Ground water was not encountered during drilling No long term measurements taken				
FIELD DESCRIPTION OF STRATA											LL	PI			
0.5	448	2	100							0.0 / 449.0 2-in TOPSOIL Tops	35	N.P.	19.6	51.9	
1.0		2							0.2 / 448.8 Red, SILT, contains mica, firm, moist ML						
1.5		3													
2.0	446	3								2.0 / 447.0 Brown, SILT, trace sand, contains mica, stiff, moist ML			17.5		
2.5		3	89												
3.0		4													
3.5	444	3								4.5 / 444.5 SAME, SANDY SILT ML			14.7		
4.0		4													
4.5		3													
5.0	442	4	100							7.5 / 441.5 SAME, ML					
5.5		4													
6.0		4													
6.5	440	3													
7.0		4													
7.5		7													
8.0															
8.5															
9.0															
9.5															
10.0										Boring Terminated at 10.0 ft					

GROUND WATER
 Ground water was not encountered during drilling
 No long term measurements taken

FIELD DESCRIPTION OF STRATA

0.0 / 449.0
2-in TOPSOIL Tops
 0.2 / 448.8
 Red, SILT, contains mica, firm, moist **ML**

2.0 / 447.0
 Brown, SILT, trace sand, contains mica, stiff, moist **ML**

4.5 / 444.5
 SAME, SANDY SILT **ML**

7.5 / 441.5
 SAME, **ML**

Boring Terminated at 10.0 ft

REMARKS: Rig Type: CME 55.
 Boring backfilled upon completion.
 The station and elevation information was estimated from the plan and are to be considered approximate not a result from professional survey.

PAGE 1 OF 1

BH-2

SPT_LOGS\LOGS RTE 718.GPJ.8.30.003:012512:6/22/15



PROJECT #: HSIP-023-707,P101,M501
LOCATION: Culpeper
STRUCTURE: 29 EXISTING ROADWAY

BH-3

PAGE 1 OF 1

STATION: 114+75
NORTHING: ft
SURFACE ELEVATION: 440.0 ft

OFFSET: 35' Left CL
Easting: ft
COORD. DATUM:

FIELD DATA

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL		SAMPLE LEGEND	SAMPLE INTERVAL	ROCK			STRATA LEGEND	Date(s) Drilled: 5/13/15 - 5/13/15 Drilling Method(s): 3.25 in HSA SPT Method: Automatic Other Test(s): Driller: O. Gomez (DMY) Logger: Assefa A. (VDOT)	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)			CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °					
										GROUND WATER Ground water was not encountered during drilling No long term measurements taken			
										FIELD DESCRIPTION OF STRATA	LL	PI	
0.5										0.0 / 440.0 12-in ASPHALT ASPH			
1.0										1.0 / 439.0 6-in CRUSHED AGGREGATE CRA			
1.5		23			1.5					1.5 / 438.5 Light Brown, SANDY SILT, trace gravel, contains mica, hard, moist ML			22.9
2.0	438	17											
2.5		14											
3.0			75										
3.5		9											
4.0	436	5			3.5					3.5 / 436.5 Gray, SILTY SAND, contains mica, medium dense, moist SM			20.4
4.5		3											
5.0		5											
5.5		5			5.5					Boring Terminated at 5.5 ft			

REMARKS: Rig Type: CME 55.

Boring backfilled upon completion and patched with fast setting concrete.

The station and elevation information was estimated from the plan and are to be considered approximate not a result from professional survey.

PAGE 1 OF 1

BH-3

SPT LOG LOGS RTE 718.GPJ.8.30.003:012512:6/22/15



PROJECT #: HSIP-023-707,P101,M501
LOCATION: Culpeper
STRUCTURE: CUT

BH-4

PAGE 1 OF 1

STATION: 116+25
NORTHING: ft
SURFACE ELEVATION: 450.0 ft

OFFSET: 35' Right CL
Easting: ft
COORD. DATUM:

FIELD DATA

Date(s) Drilled: 5/13/15 - 5/13/15
Drilling Method(s): 3.25 in HSA
SPT Method: Automatic
Other Test(s):
Driller: O. Gomez (DMY)
Logger: Assefa A. (VDOT)

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL		SAMPLE LEGEND	SAMPLE INTERVAL	ROCK			STRATA LEGEND	Drilling Method(s): 3.25 in HSA SPT Method: Automatic Other Test(s): Driller: O. Gomez (DMY) Logger: Assefa A. (VDOT)	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	FINES CONTENT #200 (%)	
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)			CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °							
								STRATA							JOINTS
GROUND WATER															
Ground water was not encountered during drilling No long term measurements taken															
FIELD DESCRIPTION OF STRATA															
0.5	2									0.0 / 450.0	43	14	17.9	68.9	
1.0	3	100								3-in TOPSOIL Tops					
1.5	3				1.5					0.25 / 449.75					
2.0	448									Red, SILT, contains mica, firm, moist ML					
2.5										2.0 / 448.0					
3.0	3				2.5					SAME, stiff ML	43	14	17.8	68.9	
3.5	5	100													
4.0	446	5			4										
4.5										4.5 / 445.5					
5.0	5				5					SAME, ML					
5.5											43	14	17.1	68.9	
6.0	444	4	100												
6.5		4			6.5										
7.0															
7.5															
8.0	442									7.5 / 442.5	43	14	17.1	68.9	
8.5		8			8.5					Light Orange, SANDY SILT, contains mica, very stiff, moist ML					
9.0															
9.5		10	55												
10.0	440	10			10										
Boring Terminated at 10.0 ft															

REMARKS: Rig Type: CME 55.

Unidentified utility line was damaged and Boring backfilled upon completion.

The station and elevation information was estimated from the plan and are to be considered approximate not a result from professional survey.

PAGE 1 OF 1

BH-4

SPT_LOGS\LOGS RTE 718.GPJ.8.30.003:012512:6/22/15



PROJECT #: HSIP-023-707,P101,M501
LOCATION: Culpeper
STRUCTURE: 29 EXISTING ROADWAY

BH-5

PAGE 1 OF 1

STATION: 117+00
NORTHING: ft
SURFACE ELEVATION: 445.0 ft

OFFSET: 30' Right CL
Easting: ft
COORD. DATUM:

FIELD DATA

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL		SAMPLE LEGEND	SAMPLE INTERVAL	ROCK			STRATA LEGEND	Drilling Method(s): 3.25 in HSA SPT Method: Automatic Other Test(s): Driller: O. Gomez (DMY) Logger: Assefa A. (VDOT)			LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)			CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA		JOINTS	GROUND WATER					
											Ground water was not encountered during drilling No long term measurements taken					
											FIELD DESCRIPTION OF STRATA					
0.5										0.0 / 445.0 13-in ASPHALT ASPH						
1.0	444															
1.5		10			1.5						1.1 / 443.9 3-in CRUSHED AGGREGATE CRA					
2.0		7	11								1.35 / 443.65 Dark Brown, SILTY SAND, trace gravel, contains mica, medium dense, moist SM					
2.5			9													
3.0	442	3			3						3.0 / 442.0 SAME, Light Brown, SILT ML					
3.5		5														
4.0		8	100													22.5
4.5			8													
5.0	440				5						Boring Terminated at 5.0 ft					

REMARKS: Rig Type: CME 55.

Boring backfilled upon completion and patched with fast setting concrete.

The station and elevation information was estimated from the plan and are to be considered approximate not a result from professional survey.

PAGE 1 OF 1

BH-5

SPT LOG LOGS RTE 718.GPJ.8.30.003:012512:6/22/15





PROJECT #: HSIP-023-707,P101,M501
LOCATION: Culpeper
STRUCTURE: 718 SHOULDER

BH-7

PAGE 1 OF 1

STATION: 201+25
NORTHING: ft
SURFACE ELEVATION: 445.0 ft

OFFSET: 15' Right CL
Easting: ft
COORD. DATUM:

FIELD DATA

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL		SAMPLE LEGEND	SAMPLE INTERVAL	ROCK			STRATA LEGEND	Drilling Method(s): 3.25 in HSA SPT Method: Automatic Other Test(s): Driller: O. Gomez (DMY) Logger: Assefa A. (VDOT)	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)			CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °						
								STRATA						JOINTS
GROUND WATER														
Ground water was not encountered during drilling No long term measurements taken														
FIELD DESCRIPTION OF STRATA											LL	PI		
0.5										0.0 / 445.0				
										4-in ASPHALT ASPH				
1.0	444	10			1					0.3 / 444.7				
										6-in CRUSHED AGGREGATE CRA				
1.5		12								0.8 / 444.2				
2.0		6	42							Brown, LEAN CLAY, trace gravel, contains mica, very stiff, moist CL			9.7	
2.5														
3.0	442	8			3									
3.5		7								3.0 / 442.0				
4.0										SAME, Gray CL				
4.5		7	100										14.3	
5.0	440				5									
Boring Terminated at 5.0 ft														

REMARKS: Rig Type: CME 55.

Boring backfilled upon completion and patched with fast setting concrete.

The station and elevation information was estimated from the plan and are to be considered approximate not a result from professional survey.

PAGE 1 OF 1

BH-7

SPT LOG LOGS RTE 718.GPJ 8.30.003:012512:622/15



PROJECT #: HSIP-023-707,P101,M501
LOCATION: Culpeper
STRUCTURE: EXISTING CROSSOVER

BH-8

PAGE 1 OF 1

STATION: 120+85
NORTHING: ft
SURFACE ELEVATION: 443.0 ft

OFFSET: 5' Right CL
Easting: ft
COORD. DATUM:

FIELD DATA

Date(s) Drilled: 5/13/15 - 5/13/15
Drilling Method(s): 3.25 in HSA
SPT Method: Automatic
Other Test(s):
Driller: O. Gomez (DMY)
Logger: Assefa A. (VDOT)

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL		SAMPLE LEGEND	SAMPLE INTERVAL	ROCK			STRATA LEGEND				
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)			CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °					
												LIQUID LIMIT	PLASTICITY INDEX
												MOISTURE CONTENT (%)	FINES CONTENT #200 (%)
										GROUND WATER			
										Ground water was not encountered during drilling No long term measurements taken			
										FIELD DESCRIPTION OF STRATA			
										LL	PI		
0.5										0.0 / 443.0			
1.0	442	3			1					4-in ASPHALT Asph			
1.5		5								0.3 / 442.7			
2.0		6	75							6-in CRUSHED AGGREGATE CRA			
2.5		10								0.8 / 442.2			
3.0	440	5			3					Brown, FAT CLAY, trace sand, contains mica, stiff, moist	90	52	37.5
3.5		5								CH			
4.0		6	59							3.0 / 440.0			
4.5		9								SAME, LEAN CLAY CL			27.5
5.0	438				5								
										Boring Terminated at 5.0 ft			

REMARKS: Rig Type: CME 55.

Boring backfilled upon completion and patched with fast setting concrete.

The station and elevation information was estimated from the plan and are to be considered approximate not a result from professional survey.

PAGE 1 OF 1

BH-8

SPT_LOGS\LOGS RTE 718.GPJ\8.30.003\012512\6/22/15